

How to make glue from milk essay sample

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During the ancient times, people were using either gums from plants or boiled-down bones and hides of animals as their adhesives or glues. These glues needed such a long time to dry and stick. And when the glue finally sticks, they formed a structure that was not particularly strong and durable. These adhesives were usually used in woodworking wherein the liquid glue flowed in the wood pores, and then dried, bonding the wood together.

Due to the lack of durability of the adhesive in the past centuries, many people looked for stronger and fast-drying glues which led to the discovery of the synthetic glues we use nowadays. These modern adhesives dry quickly and form strong bonds.

Superglues which are also known as instant glues set in seconds. They are the synthetic or commercial glues that we use today. Epoxy resins are also available wherein two ingredients are mixed together and then set in 10 to 30 minutes.

Since glues are used to stick objects together, it is a necessity for everyday living. Without adhesives, simple things that were broken will not be any more functional. There will be an immediate need to purchase another object to replace the broken one. With glue, things that were detached could be joined again together to get the desired result.

On the other hand, commercial or synthetic glue could be purchased in stores but these stores are not always available or open at a certain point of time. If there is a need for glue in the middle of the night, and having the certain materials to make homemade glue, it could be of great help.

RATIONALE OF THE STUDY

Since the glue has been a part of everyday life, and it has been a necessity for the people, the researchers conducted a scientific investigatory project to know if it is possible to make an adhesive, particularly glue out of common substances in the kitchen. This investigatory project was done to make alternative glue instead of commercial glue. This was also conducted to be able to use kitchen substances that are not always consumed, to avoid spoilage and waste. Utilization and functionality of the materials and substances were taken into consideration.

SIGNIFICANCE OF THE STUDY

The results of the study may be beneficial to students who may be able to use the product in their school works. It may be significant to family, having needs of adhesive at home. The product may also be beneficial to the community since it could be manufactured and purchased in the market.

It really could benefit the industries because if it was proved that the glue is so much effective, it could replace the synthetic glues in markets. And if it helps save the environment, it would be of great help to the world. The results could also benefit the environment since the glue just used substances available at home unlike other commercial glues that contain harmful chemicals.

It could be of help to businesses and manufacturers of adhesives so that they may know that there are alternative ways to make glue. Once they

were already utilizing the new way of making glue, they might as well improve their business.

CHAPTER II

REVIEW OF RELATED LITERATURE

This chapter presents the concepts related in the scientific investigatory project. The researchers present the history of glue as adhesive and how it evolved and turned into the synthetic glue known to us today. The materials and substances used in the investigatory project were analyzed and the reasons why they were used were also discussed. The process on how glue manages to stick objects is also held in focus.

Adhesive is a sticky substance used to combine or adhere objects. A particular example of it is the glue. The glue is a sticky jelly-like substance, used for sticking things together. These substances were used from the ancient times and up to present.

During the 18th century, either gums from plants or hides and bones of animals are used as glues in woodworking. But these adhesives are not that strong. But despite of this, the people used the glue to stick pieces of wood together.

Today, glues are synthetic. They dry quickly and form really strong bonds. The ones that act the fastest are called superglues or instant glues. These synthetic glues set in seconds. Synthetic glues are made from petroleum chemicals that formed into acrylic resin. When the glue is exposed to even

the smallest trace of moisture, the small molecules form longer ones in a process called polymerization.

The glue contains acidic stabilizer that prevents the adhesive molecules to combine. With this, the glue is kept liquefied. The acidic stabilizer is neutralized when it gets in contact with moisture. Once the stabilizer has been neutralized, the adhesive molecules combine in chains, forming a semi-solid to solid fixative.

In this scientific investigatory project, the researchers used skim milk or so-called non-fat milk instead of whole milk which has whole fat content. It is to avoid too much curdling in the mixture. The white vinegar which is the stabilizer will be neutralized once it gets contact with the baking soda and water which provides moisture. White vinegar was used to maintain the color of the mixture which is white. The stabilizer which happens to be the vinegar keeps the molecules from linking and keeps the glue liquefied.

DEFINITION OF TERMS

The following terms are defined to facilitate further understanding in the concepts related in the scientific investigatory project.

Adhesive. A sticky substance used to adhere or stick things together.

Glue. A sticky jelly-like substance used to stick join objects together; an example of adhesive.

Synthetic. Produced artificially by chemical means as to a glue manufactured from chemicals.

Superglue. Also called instant glue because it dries quickly and it produce strong bonds.

Resin. Any of various substances from plants like gum and sap of trees.

Polymer. A chemical compound formed by union of small molecules, consisting of repeating structural units.

Polymerization. A chemical reaction where two or more molecules combine to form polymers.

Stabilizer. A substance that holds to steady as in a mixture.

Neutralizer. A substance that entails equilibrium.

Curdling. A process that forms curds which are the protein-rich part of coagulated milk or in this case, skim milk. CHAPTER III

METHODOLGY AND PROCEDURE

MATERIALS

1. Non-fat milk or skim milk – primary component of the product which is glue
2. Glass or enamel saucepan – where the heating of the mixture takes place
3. Tablespoon – used in measuring specific amounts of white vinegar and baking soda
4. Measuring cup – used in measuring the quantity of the water to be put in the mixture
5. Stove – used in heating the mixture to form the glue

6. Water – used together with the baking soda in neutralizing the vinegar
7. White Vinegar – reacts with the milk to form clumps
8. Sodium Bicarbonate (baking soda) – used in neutralizing the vinegar in the mixture
9. Baby food jar or glue container – where the glue, the finished product, is placed

PROCEDURES

1. Put a pint of milk into a saucepan.
2. Add six tablespoons of white vinegar then stir.
3. Heat the saucepan on a stove using medium heat. Stir continuously, not using too much force, until clumps form.
4. When clumps are already forming, remove the saucepan from the heat. The clumps indicate that the milk is curdling.
5. Continue stirring moderately until the curdling stops.
6. Pour the liquid portion (called the whey) of the milk, leaving the curds in the pan. Remove as much of the liquid as possible.
7. Add $\frac{1}{4}$ cup of water and one tablespoon of baking soda. Stir well until small bubbles appear which indicates that the bicarbonate is neutralizing the vinegar.
8. Transfer the mixture into a jar or glue container. Then there is already manufactured glue.
9. To try its effectiveness, put a small amount of the mixture into a paper and let it dry for some time. The papers would have been stuck together.

CHAPTER IV

RESULTS AND DISCUSSION

This chapter reveals the things that happened in the scientific investigatory project that was conducted. It presents the observations, the descriptions of the by-product and the over-all results of the project.

RESULTS

The mixture that was formed from the white vinegar, skim milk and baking soda, together with the other substances really looked like glue. Its white color resembles the synthetic glue known to us nowadays. Small bubbles were also present in the mixture. Its texture was a little bit slimy and smooth. Stickiness was also a characteristic of the mixture. The mixture was a glue-like substance, in color and in texture.

DISCUSSION

Glue is an example of adhesive. The researchers tried using the homemade glue. They waited for a certain time to let the glue dry. And they examined if the testing object or paper stuck. They found it hard to remove it. It was a good proof that the glue manufactured from certain kitchen substances is effective. They realized that medium heat was really the best intensity of flame in heating the mixture because it entails moderation. If they used the low heat of flame, no curdling process or so minimal reaction would take place. If they used the maximum heat, too much curdling would take place and too many bubbles would appear. Temperature played a vital role in the manufacture of glue in this certain investigatory project.

Force became also a component in the success of the investigatory project. The force used in stirring the mixture must not be too much because it could ruin the desired consistency of the mixture. The mixing process was an essential step in the manufacture of the glue. If the stirring was too weak, too much curdling would take place and the mixture would be so thick, not having the consistency of glue. So the stirring really must be done in moderation.

They were able to know that the mixture was white because of the substances that they used like skim milk, baking soda, and white vinegar. The smell was not pungent and it was tolerable. It doesn't give off foul smell. Further tests may be conducted to know the span of time in which the glue could be used, before it spoils. The consistency was alright, somewhat similar to a synthetic glue. It is also sticky just like commercial glue.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

This chapter presents the drawn conclusions from the investigatory project. Concepts which were learned and theories which were proven are showed here. Lessons and realizations are also included to aid further understanding. Recommendations are given to help other researchers or people who would make certain investigation to understand the concepts included. It also give suggestions on how to improve the study.

CONCLUSIONS

The researchers were able to make glue out of substances and materials found in the kitchen. They proved that there is an alternative way to make adhesive, particularly glue. They were able to test whether it could stick things together. And when they were making the glue, certain factors contributed to the making of the glue.

Two of these factors are the heat of the flame, and the force exerted in stirring the mixture. These efforts were done to ensure that the curdling process is done properly. The certain measures followed by the researchers ensured that the mixture is not too thick and not too runny, just the right consistency and the right amount of clumps.

Taking into considerations the materials and substances, and obeying the procedures marked the flow of the investigatory project. Without the proper comprehension of the uses of the materials and the procedures might have caused unsuccessful outcome or worse, accident. It is really important to understand fully the methods to avoid errors that might lead to untoward incidents.

RECOMMENDATIONS

The researchers recommend further study about the manufactured homemade glue. Feasibility study may be done to know if the glue is feasible or practical to use. It could ensure if making it will conserve money instead when buying synthetic glue.

They also suggest making further studies about the product, more importantly, in the span of time to use the glue. The further study should

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know the expiration period. Once the researchers have found out the span of time before the glue spoils, they could make researches on how to preserve the glue. With this, they could know certain techniques to lengthen the the use of the adhesive.

After these feasibility study and further research about it, they could tell if it is a good replacement for the synthetic glue. Once it was proved to be feasible and safe, it could also be a product in the market. Businesses might be engaged in manufacturing glue from the certain kitchen substances.

Selling the product could also merit income but first, the researchers recommend further studies including the quality of the glue. Feasibility study is also important to know if it is practical to make the glue.

On the other hand, researches about the commercial or synthetic glue must also be conducted. It is for the reason that it is important to know if it has harmful chemicals. Since ‘ synthetic’ means chemically manufactured, there is a possibility that synthetic glue contains hazardous substances.

Once the researchers found out that commercial glues contain harmful chemicals, they may continue to find alternative ways to manufacture glue. With their efforts, they help the people, as well as the environment.

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